UPPER TRISHULI-1 HEP (216MW)

Client	**Nepal Water and Energy Development Company Private Limited**
Owner's Engineer	**Tractebel Engineering GmbH / Jade Consult**

REVIEW NOTE

Contractor	**Doosan Enerbility**		
Title of the Document	Excavation and Support Drawings above EL 921.50		
Document No.	UT1-C-300-CVL-DG-60002	Revision	0A
Date of Documents	22.05.2022	Received Date	24.05.2022
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Review Note No.	**RN-0140**	**Present Review Date**	**15.06.2022**
		Present Review Status	**AN**

A: Approved AN: Approved as Noted RR: Returned for Resubmission FI: For Information, only

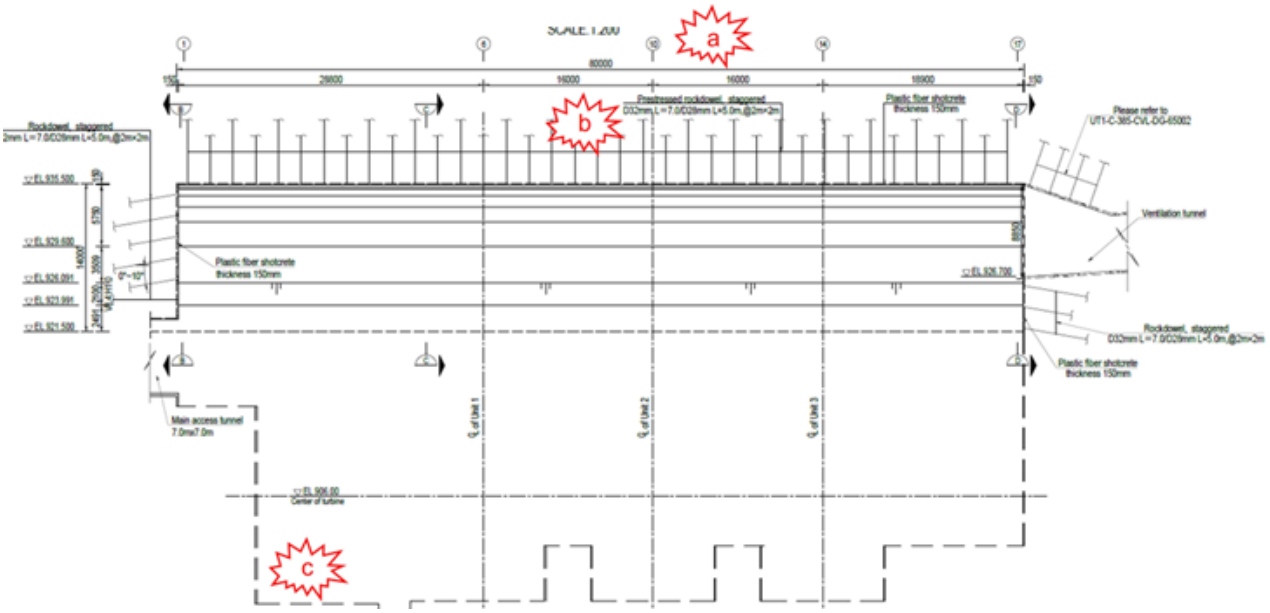
General Comments

The construction drawings do not incorporate any drainage measures, such as weep holes, drainage strips or systematic drainage. Such measures, generally systematically applied need to be designed and incorporated in the drawings.

This review note refers to the constructability, only.

Note: "bolts" are always tensioned, and "dowels" are always untensioned rock reinforcement.

Other comments see below.

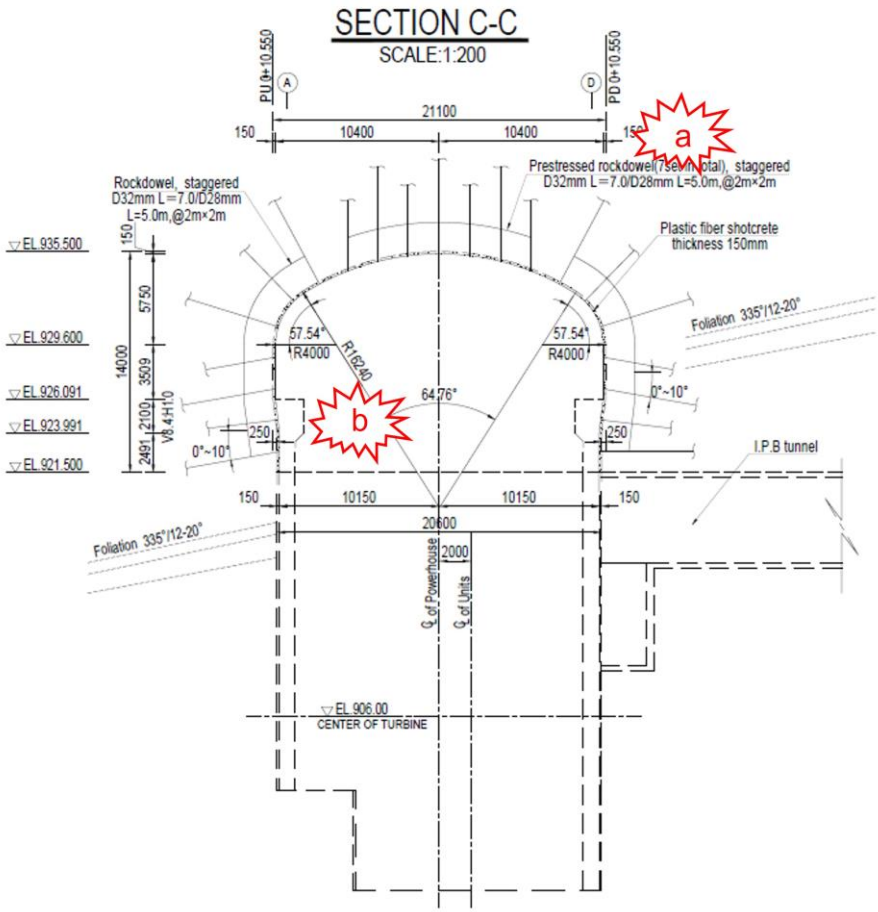


(a) Provide chainage, start with 0+000 at mouth of Ventilation Tunnel.
(b) Indicate also untensioned dowels in roof. Mention / indicate sidewall support.
(c) Provide individual floor levels with elevation.

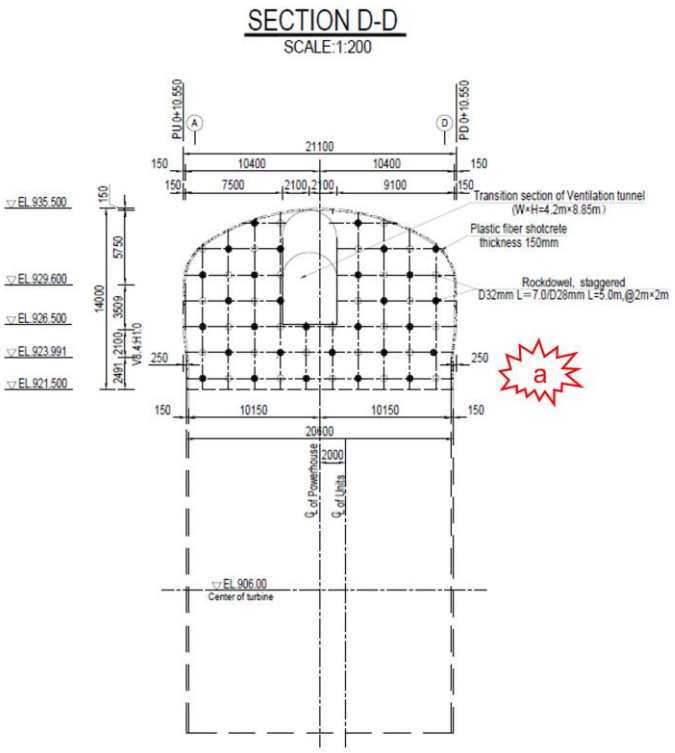
NOTE

1. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
2. As per available information at present, rock class of underground powerhouse is assumed as II or III, supports shown on this set of drawings are applied to class II only.
3. Symbol description:
   R-denotes round bar, yield strength is 280MPa.
   D-denotes deformed bar, yield strength is 500MPa.
4. The cylinder specified compressive strength of shotcrete at 28 days is 25MPa.
5. Outline below EL.925.10m is only sketched and is subjected to final design of powerhouse and subsequent drawings.
6. The number of pre-stressed ROCKDOWELs at crown area can be adjusted as indication by OE on site as per exposed geological conditions.
7. The pre-stress applied to crown ROCKDOWELs is taken as 50% of the allowable tensile strength of ROCKDOWEL times section area of rebar.
8. To rockdowels adjacent to main access tunnel, I.P.B tunnel, the dip angle shall be adjusted to horizontal to avoid be penetrated into such tunnel opening.

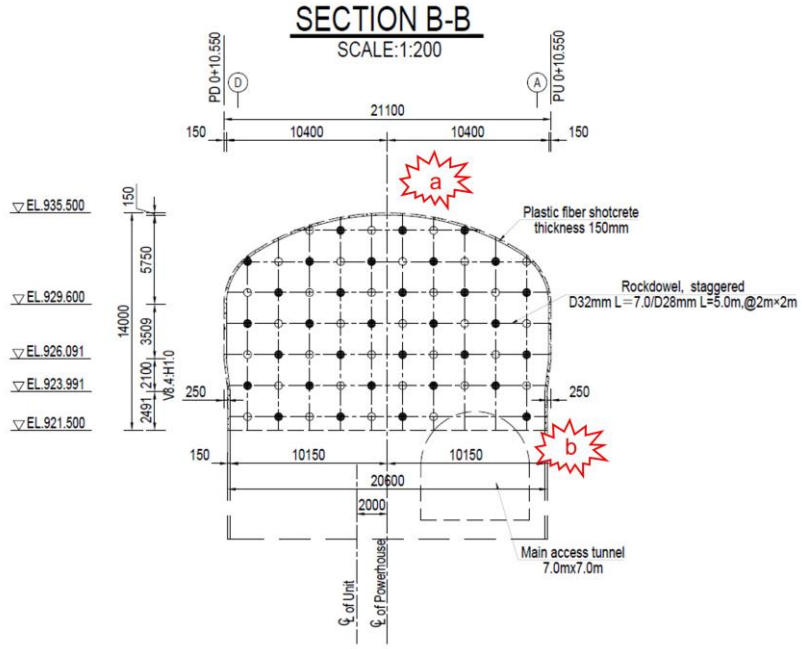
(a) „is assumed as II“ not “II or III”.
(b) Delete item 5.
(c) Change to “The pattern of pre-stressed bolts and dowels is the general requirement for Class II rock. Additional support, bolts/dowels may be locally required for rock classes worse than II.
(d) Add: “Development of bolt stress will be monitored and adjustments of stressing force can be made, if necessary”.



(a) Indicate also dowels and pattern.
(b) Consider whether dowels to back-anchor the columns for the crane beam are installed during excavation or later.



(a) Indicate floor levels in drawing. Indicate (systematic) drainage system.



(a) Indicate floor levels in drawing, if any. Indicate (systematic) drainage system.
(b) Note special support of mouth of Main Access Tunnel.

Disclaimer:

Any approval will not release the Contractor from any of his obligations under the Contract.

Dr. U. Glawe